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## 1 News

### 1.1 Hannover Messe April 8-12, 2013

#### Leading Industrial Automation Brand Delta Electronics Impresses Global Market at Hannover Messe 2013



The global leader in power management and thermal solutions, Delta Group, has just completed exhibiting at Hannover Mess 2013 where it showcased Delta's green energy concepts, industrial automation, power systems and power management. Led personally by Chairman Mr. Yancey Hai and CEO Mr. Ping Cheng, Delta's determination to reach a global market with its proprietary brand was on full display and it was among

the biggest Taiwanese exhibitors at the show. Adhering to this year's tradeshow theme of Industrial Automation, Delta presented a wide range of automation solutions and products for various industries, showing its state-of-art technology and strong integration abilities. Delta's stand attracted hundreds of guests from nearly fifty countries around the world on the opening day and it became one of the show's most popular Asian exhibitors.

#### Delta Industrial Automation Shows its Vision for the Industrial Automation Field

As the biggest Taiwanese exhibitor at both Hannover Messe 2012 and 2013, Delta displayed a full range of smart and energy-saving industrial and green building solutions and focused especially on solutions and products for industrial automation.

Emphasizing system integration and industrial solutions, the IABG presented one new live demo: the Multi-axis Motion Control for Linear Motors Demo. This live demo is composed of three sets of Delta's latest ECML-S1606A1 Series linear motors and six ASDA-A2R Series AC servo drives, together with a DOP-B Series HMI and DVP10MC Series PLC. Users can conduct program editing and parameter settings with the DOP-B HMI, and then commands are transferred to the ASDA-A2R AC servo drive via the DVP10MC PLC to control the linear motors and perform high-speed and precise synchronous/asynchronous positioning.



Presenting the complete functions and performance of Delta's industrial automation products, the IABG introduced the C2000 Series AC motor drives, IED and ED Series elevator drives, AFE2000 Series active front end and APF2000 Series active power filter with solutions for cranes, elevators, machine tools, the textile industry, HVAC systems and power quality improvement.

The IABG also displayed industrial Ethernet network solutions, NC solutions, gantry solutions, motion control and multi-axis control to showcase Delta's achievements in communication and motion control. Among these solutions, Delta's DVS industrial unmanaged Ethernet switch is perfect for application to Ethernet network solutions, and the three-in-one ASDA-M Series AC servo drive with built-in PLC meets the demands for gantry solutions and motion control for high-end industries. Delta's mid-range AH500 Series PLC was designed with powerful functions and complete software support and can be applied in high-end industries and building automation. The IABG also presented many other new products such as the ASDA-A2-E Series AC servo drive, and more, providing a total solution for industrial communication and motion control.

As for industrial control, Delta's new Open HMI, the DOP-W Series, provides an open platform to integrate customized projects, and is able to be applied with IP cameras depending on the application. Delta also presented a whole new HMC Series human machine interface and controller with built-in controller function, and users are able to conduct programming and control functions easily with one machine. What's more, the hand-held design of the HMC is more flexible and convenient for different operations. The DMV Series machine vision system and DT3 Series temperature controller provide crucial support to Delta's solutions, making them more user-friendly and complete especially when applied to the energy management visualization of green buildings.

### **Delta International Press Conference on Successful Energy-Saving Achievements and Applications for Buildings in the EMEA Markets**

Delta Group held an international press conference at Hannover Messe on April 9th which attracted around 30 journalists from all over the world. At the press conference, Delta's Taoyuan Technology Center became a hot topic once again.

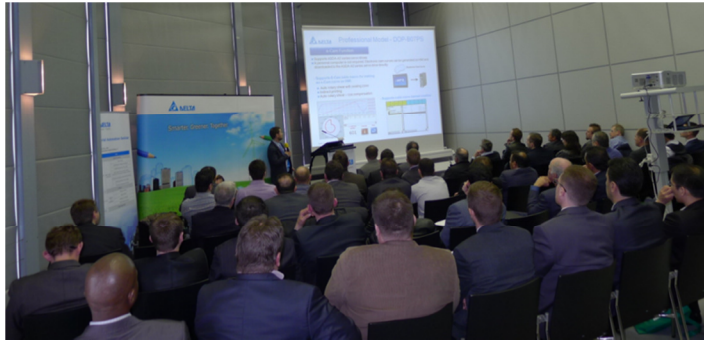
Mr. Yancy Hai, chairman of Delta Electronics, said, "With a promise of 'Smarter. Greener. Together', Delta has integrated our industrial automation and energy efficient building solutions that provide a more intelligent and comfortable environment with less energy consumption. Our LEED-certified green building, the Taoyuan Technology Center, is a successful application that saves 53% in energy compared to same-size office buildings under the same climate conditions. This significant result is achieved with the system integration of Delta's energy-efficient solutions, including HVAC solutions and elevator solutions, which both achieve 52% energy savings, and LED lighting for 50% energy savings, and more."



Delta also shared the successful application of Delta's energy saving solutions in European markets. Jackie Chang, president and general manager of Delta EMEA, indicated, "Delta has been consistently applying our know-how in power electronics and energy management to various industries in the EMEA, making us a reliable partner for customers who pursue sustainability. Now we are providing energy-saving solutions to data centers in Russia and Poland, telecom power systems to major carriers in Europe,

India and Africa, EV charging solutions for highway infrastructure in Norway, and process automation of water treatment in Greece, as well as building energy management for a fashion chain store in Spain.”

### Delta Industrial Automation Seminar Impresses Guests and Brings Business



The press conference was followed by the Industrial Automation Seminar hosted by the IABG. The IABG's sales and engineering team gave an in-depth introduction to Delta's new C2000 Series AC motor drive (690 V type), APF2000 Series active power filter, DOP-W Series HMI, HMC Series human machine interface & controller, DVS Series unmanaged Ethernet switch, DMV Series machine vision system and DT3 Series temperature

controller. The IABG also shared its successful applications of Delta's elevator solution, gantry solution, machine tool solution and water treatment solution. Around fifty global IABU distributors participated in the seminar and they were impressed by the introduction to market trends, products and solutions. Many had technical discussions with the IABG team.

### Partying at the Famous Munich Hall



The conference and the seminar were not the only two important events on April 9th. Later in the evening, a dinner party was held in the famous Munich Hall. For years, dinner in Munich Hall has been a tradition during Delta's exhibition at Hannover Messe. It's a place for Delta's team and global distributors to relax and chat. With the larger scale of this year's exhibition the dinner party was a time for celebration. Among the global exhibitors were over a hundred Delta leaders, managers, and service team, plus the distributors and clients of IABG, all enjoying the live band as everyone waved along with the music. It was a party atmosphere with delicious German food and cold beer. Mr. Yancey Hai, Mr. Ping Cheng and other managers also joined in and had a great time with all participants.

## 1.2 ftp-site

Just to let you know (again), you can find the latest info about our products (manuals, pictures, catalogues, application notes, presentations, etc) on our ftp-site.

<ftp://den-eindhoven:BuPd2175@ftp2.euro.delta-corp.com/deltronics-eindhoven/customer-service>

Name and password are included in the link.

Name: den-eindhoven

Password: BuPd2175

## 2 Product update

### 2.1 NEW – REG2000

A traditional drive system used for inertia load work generally performs rapid deceleration, braking and positioning. When its motor is in generator mode it produces large amounts of regenerative energy that must be consumed to maintain a stable DC bus voltage and safe operation. The traditional method to solve the regenerative energy problem is to install a brake resistor. While it is easy to install and is low cost, it takes up a large amount of space and requires installing additional devices to dissipate the heat. This method provides limited efficiency and wastes the regenerative energy.

Delta's REG2000 series is capable of collecting and converting your system's regenerative energy into reusable electricity for the ultimate in energy savings. The installation process is as simple as installing a brake resistor, but with only half the size and better efficiency. The REG2000 is your best green energy solution for power regeneration.

#### Features

1. Lower harmonics and high power factor using sinewave PWM control
2. Compact design with reactor included and easy installation needs only 5 wires
3. Replace traditional brake resistor providing reduced heat generation and more than 95% power regeneration efficiency
4. Improves drive brake torque 125% to 150%
5. MODBUS 485 communication to real-time monitor kWh and cost
6. High flexibility, compatible with other inverter and servo drives
7. Parallel connection (up to 6 units) for large power applications
8. Option cards: MODBUS TCP, CANopen(DS301), PROFIBUS, DeviceNet, EtherNet/IP

#### Specification:

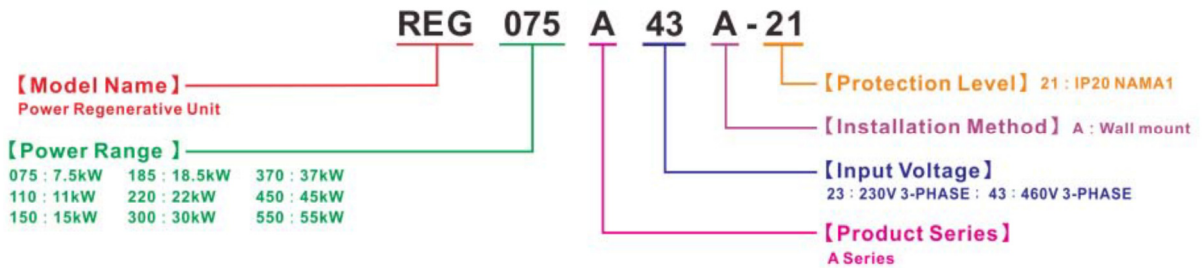
##### 230V Series

Frame		A		B			C	
Model number REG_ _ _A23A-21		075	110	150	185	220	300	370
Power rating (kW)		7.5	11	15	18.5	22	30	37
Mains	Input current (A)	20	32	38	49	60	80	100
	Voltage / frequency rating	3-phase AC 200V - 240V (-15% - +10%), 50/60Hz						
	Operation voltage	170~265Vac						
	Frequency Tolerance	47~63Hz						
Feedback activation DC voltage range		300 - 360Vdc (can be adjusted via parameter 01-08)						
Net weight		7.9± 0.5Kg		14.2± 0.5Kg			26.4± 0.5Kg	28.0± 0.5Kg

##### 460V Series

Frame		A			B			C		
Model number REG_ _ _A43A-21		075	110	150	185	220	300	370	450	550
Power rating (kW)		7.5	11	15	18.5	22	30	37	45	55
Mains	Input current (A)	10.5	17	20	25	32	43	49	60	75
	Voltage / frequency rating	3-phase AC 380V - 480V (-15% - +10%), 50/60Hz								
	Operation voltage	323~528Vac								
	Frequency Tolerance	47~63Hz								
Feedback activation DC voltage range		580 - 720Vdc (can be adjusted via parameter 01-08)								
Net weight		7.5± 0.5Kg			14.2± 0.5Kg			26.2± 0.5Kg	26.3± 0.5Kg	27.8± 0.5Kg

### Ordering information:



### Product selection and dimensioning

Delta offers four ways for Power Regenerative Unit selection:

- Make selection base on the specs of brake resistor  
Suitable for applications that require to perform rapid acceleration and deceleration, such as tapping drilling machines and lathes.
- Make selection base on the overload ability of drive:  
Servo drive has higher overload ability than an inverter.
- Make selection base on the load characteristics of applications:  
Calculate the regenerated power of the application using the application's system characteristics and specifications, especially for elevator and hoist application.
- Make selection base on Product Selection Wizard:  
The Product Selection Wizard is still under development.

You can find the manual, catalogue, selection information, etc on our ftp-site.

## 2.2 NEW –DVS-005/008/016 Series

DVS-005/008/016 series are Industrial Ethernet switches that support IEEE 802.3 10Base-T and IEEE 802.3u 100Base-T(X), IEEE 802.3x full/half-duplex, and auto-MDI/MDI-X, that are specifically

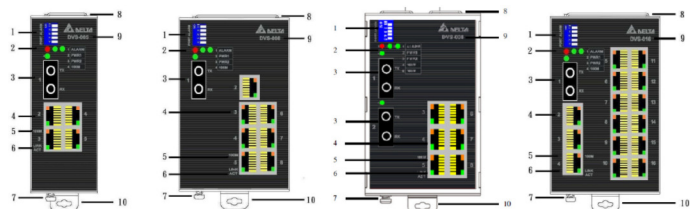


designed for harsh and hazardous industrial environments. DVS-005/008/016 switches offer excellent ruggedized hardware design with 12 to 48 VDC redundant power inputs and wide operating temperature range of -40°C to 75°C(except DVS-005100) without the use of internal fans, providing superior reliability. DIP switches for built-in alarm relay function, assist network engineers with notification when port link-down and power failures occur.

In addition, for the best network performance, broadcast storm protection can ensure high network bandwidth. The switches require no setup and start operating immediately as soon as they are powered up, and are easily installed with industrial grade DIN-RAIL and wall mounting.

DVS-005/008/016 switches comply with UL, CE and FCC standards, to guarantee reliable transmission in heavy electrical surge and EMI environments.

- Event alarm DIP Switch
- ALARM / PWR1 / PWR2 / Fiber port speed
- Fiber Ethernet port
- Ethernet port
- Speed LED
- LINK/ACT LED
- Grounding screw
- Heat dissipation orifices
- Series model name
- Din-Rail bracket



### Specifications:

#### ■ Technology

Standards	IEEE 802.3 10Base-T, IEEE 802.3u 100Base-T(X) and 100Base-FX, IEEE 802.3x, IEEE 802.1p
Processing Type	Store and Forward IEEE 802.3x flow control in full duplex , back- pressure flow control in half duplex

#### ■ Ethernet Performance

Switching Capacity	DVS-005 Series: 1Gbps DVS-008 Series: 1.6Gbps DVS-016 Series: 3.2Gbps wire-speed, non-blocking switching fabric
MAC Table	DVS-005 series: 1K MAC addresses DVS-008/016 series: 8K MAC addresses
Packet Buffer Memory	DVS-005 series: 512K bits; DVS-008/016 series: 1M bits
Broadcast Storm Protection	Default Enabled(DVS-008/016 series)
Transparent Forwarding	Default Enabled(DVS-008/016 series)
VLAN Tagged Packets	
Class of Service	IEEE 802.1p based QoS(priority queuing--CoS, QoS, ToS/DS) (DVS-008/016 series)

#### ■ Interface

Ethernet Ports	RJ45 Ports: 10/100Base-T(X), auto MDI/MDI-X, auto negotiation Fiber Optic Ports: 100Base-FX(SC connector), MultiMode or SingleMode
DIP Switch	Port link-down alarm configuration
Alarm Relay	1 relay output with current carrying capacity 5A@24VDC

#### ■ Power Requirement

Input Voltage	24VDC(12 to 48VDC) redundant inputs by terminal block
Power Consumption	Max:3.3/4.5/8 W

### Ordering information

Available		Port Combination	
Part Number	Operating Temperature	10/100Base-T(X)	100Base-FX
			SC type, SingleMode
DVS-005W01-SC01	-40℃ to 75℃	4	1
DVS-008W01-SC01	-40℃ to 75℃	7	1
DVS-008W01-MC02	-40℃ to 75℃	6	2
DVS-008W01-SC02	-40℃ to 75℃	6	2
DVS-016W01-SC01	-40℃ to 75℃	15	1

We can take your first (sample) orders; they will be shipped to us in June 2013.  
You can find more info on our ftp-site.

## 2.3 NEW – Chrome DIN Rail Power Supplies



Delta's Chrome DIN Rail Power Supply series is designed for use in compact cabinets which are widely adopted in home automation and Food & Beverages industries. Current available specifications are with 24V output voltage for power ratings of 10W and 100W. Delta's Chrome Power Supply series offers double isolated input that eliminates the need for Earth connection, thus, resulting in low leakage current. The Chrome series features universal AC input range and is certified to safety standard according to IEC/EN/UL 60950-1 Information Technology Equipment (ITE) and UL508 Industrial Control Equipment (ICE). The series is also fully compliant with RoHS Directive 2011/65/EU for

environmental protection. NEC Class 2 and Limited Power Source (LPS) approval are available for the below models.

	DRC-24V10W1AZ	DRC-24V100W1AZ
Output Voltage	24V	24V
Input Voltage	90-264Vac	90-264Vac
Dimensions (L x W x D)	91 x 18 x 55.6 mm	91 x 89.9 x 55.6 mm
Unit Weight	0.065 kg	0.35 kg
MTBF	> 500,000 hrs	> 500,000 hrs

We can take your first (sample) orders, they will be shipped to us in June 2013.

You can find the manual, catalogue, dimensions, etc on our ftp-site.

### 2.4 UPDATE – New firmware 1.18 for VFD-E

VFD-E has a new firmware v1.18 (for power board only) to correct the following problem:

#### Function correction

	v2.17/V1.17 problem	v2.17/V1.18
1	New model drive "VFD150E23A" will trip up OL1(Pr06-06=0 or1) when Pr07-00 setting is bigger than 65.5A.	New model drive VFD150E23A, its OL1 function can work normally.

### 2.5 UPDATE – Hardware/firmware DVP04PT-S changed

The hardware of DVP04PT-S is upgraded from A1 to A2 and the firmware of DVP04PT-S is upgraded to 4.06.

Now the following sensors can be selected: Pt100, Pt1000, Ni100, and Ni1000.

Users can select input sensors and disable channels by means of CR#1. The description of this new function is added to page 3 in DVP04PT-S Instruction Sheet.

CR#	Address	Save		Register content	Description
#0	H'4064	O	R	Model name	Set up by the system: DVP04PT model code = H'8A.
#1	H'4065	O	R/W	Mode setting	CH1 mode: b0 ~ b3 CH2 mode: b4 ~ b7 CH3 mode: b8 ~ b11 CH4 mode: b12 ~ b15 Take CH1 mode (b3,b2,b1,b0) for example. The default value is H'0000. 1. (0,0,0,0): PT100 2. (0,0,0,1): NI100 3. (0,0,1,0): PT1000 4. (0,0,1,1): NI1000 5. (1,1,1,1): The channel is disabled.

The new version of DVP04PT-S will be released in 2013 WK15.

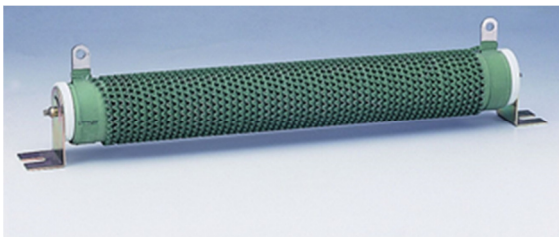
### 2.6 PHASE OUT – DVP28SV1 series

The DVP28SV1 series is phased out and replaced by the DVP28SV2 series, which is 100% compatible with its predecessor.

Discontinuation Product	Recommended Replacement	Availability
DVP28SV11R	DVP28SV11R2	Stock
DVP28SV11T	DVP28SV11T2 (NPN)	Stock
	DVP28SV11S2 (PNP)	Stock

## 3 Product highlight

### 3.1 Brake resistors



The brake resistor datasheet has been updated to include all specified brake resistors in the user manuals for Delta's AC Motor Drives.

At the same time more data have been added.

You can find the datasheet on our ftp-site. Folder AMD/AMD Options/ AMD Brake units & resistors.

## 4 FAQ

### 4.1 VFD-series AC Motor drives

#### VFD

#### VFD Series

**Q** What is the slip compensation parameter?

**A** The slip to be compensated in all our drives is calculated as follows:

$$Slip = \sqrt{\frac{(I_L)^2 - (I_{NL})^2}{(I_{FL})^2 - (I_{NL})^2}} * (Rated\_Slip) * (Slip\_Compensation)$$

where

Slip = slip to be compensated

$I_L$  = actual load current

$I_{NL}$  = no load current

$I_{FL}$  = full load current.

Rated\_slip = the motor rated slip in Hz

Slip\_compensation = slip compensation factor

In some drives the slip compensation is  $(Rated\_Slip) * (Slip\_Compensation)$

The setting range is in that case 0.0~10.0 and the rated slip cannot be entered separately

*In some drives the slip compensation is (Slip \_ Compensation)  
The setting range is in that case 0.0~3.0 and the rated slip can be entered separately*

**C2000****Q****Is the charge resistor after the DC+/DC- connection?****A***Yes, it is.**So when the drive is supplied by the DC-bus, the inrush current is still limited.*